

ABSTRACT OF THE DISCLOSURE

This invention discloses a method for fabricating SOI material, incorporating an amorphous process introduced by ion implantation in the conventional SIMOX methods, which enhances diffusion of various atoms in the amorphous region in annealing process. It realizes under a lower temperature annealing to eliminate threading dislocations and other crystal defects in the top silicon layer and silicon islands, pinholes and other silicon segregation products in the buried oxide layer and fabricate high quality of SOI material. Another method for forming SOI material is also described, incorporating an amorphous process introduced by ion implantation in the SIMNI or SIMON methods. It forms amorphous buried nitride or oxynitride layer, a top single crystal silicon layer and a sharp interface between the top layer and the buried layer.